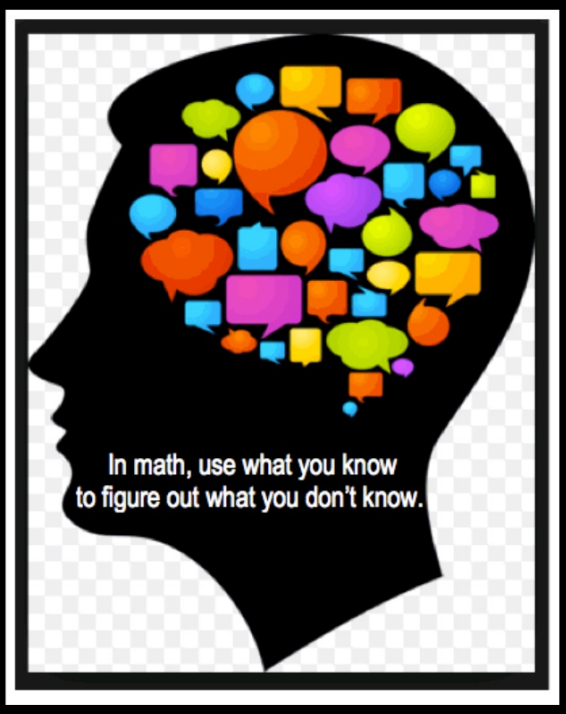


$y = x^2$

$y = -x^2$

$y = -x^2+3$ up 3

$y = x^2-4$ ↓ 4

$y = (x-2)^2$ → 2

$y = (x+3)^2$ ← 3

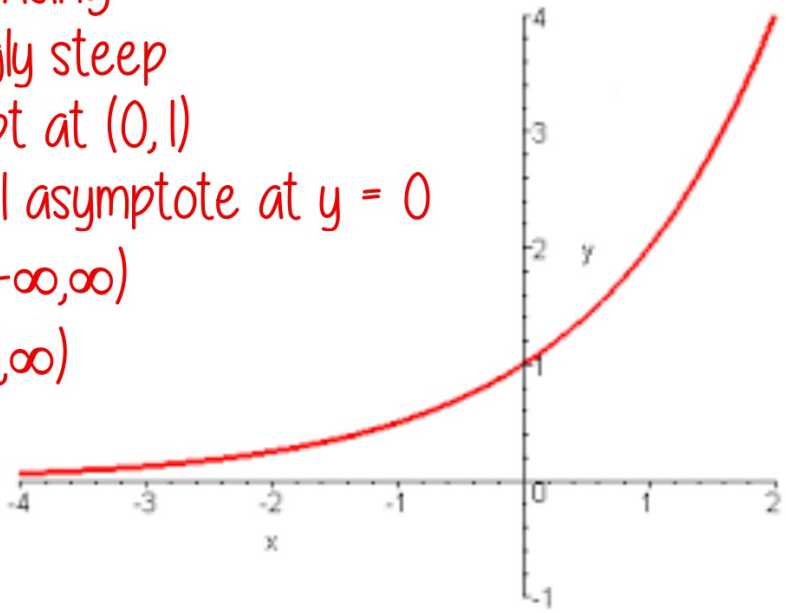
Use what you already know (generalize) about parent functions and their transformations to apply to these new graphs.

Sec 4.1 Exponential Functions
~Graphing~

We will graph and also list the domain, range and HA…with modifications.

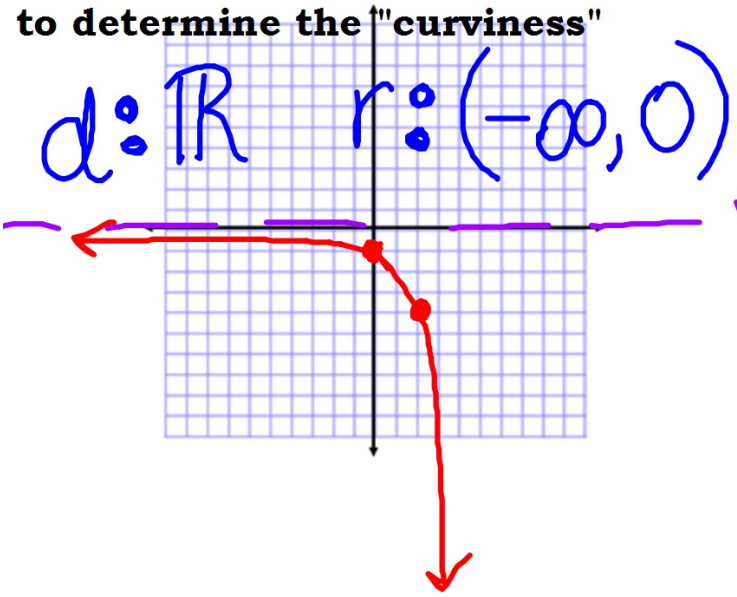
Basic shape of an exponential graph-
flat, then rising
increasingly steep
y-intercept at (0, 1)
horiziontal asymptote at y = 0
domain- (-∞,∞)
range- (0,∞)

$y = 2^x$



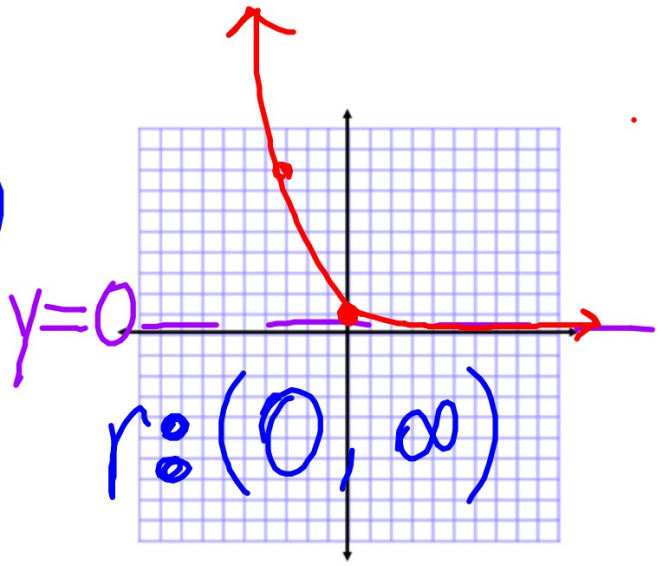
$y = -2^x$

-Graph the horiziontal asymptote, with the equation.
-Plot the y-intercept (either by flipping the original upside-down, or letting x =0 and evaluating)
-Obtain one other point in QIV to determine the "curviness"



$y = 2^{-x}$

flips over the y-axis



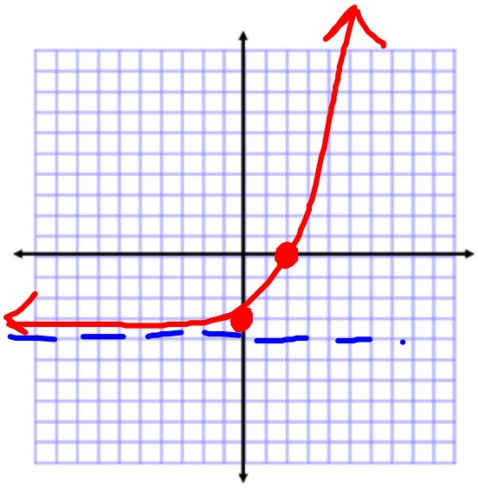
$y = 2^x + 3$

$r: (3, \infty)$

$d: \mathbb{R}$

$y = 2^x - 4$

$r: (-4, \infty)$

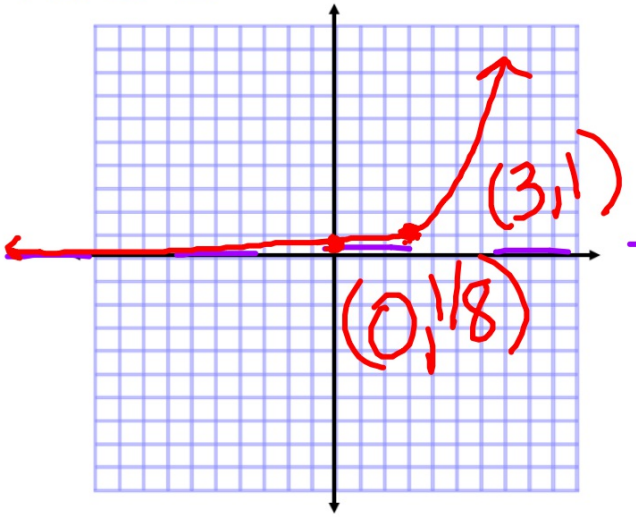


$y = 2^{x-3}$ → 3

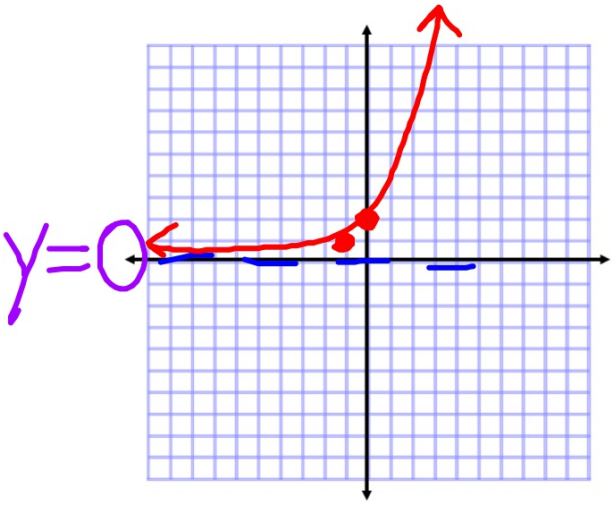
$y = 2^{x+1}$ ← 1

d: $\mathbb{R}$ r: $(0, \infty)$

y-intercept translated to -->



y-intercept translated to -->



The graph didn't move up or down, so the asymptote is still at y = 0.
It moved right 3, so the y-intercept changed.

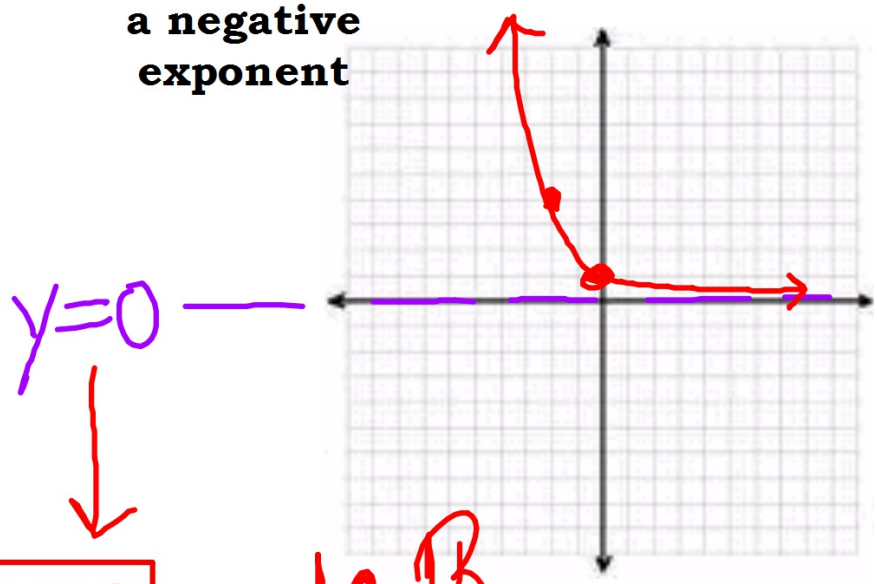
Graph using a table-

$y = \left(\frac{1}{2}\right)^x$

x	y
0	1
-2	4

domain? range? HA?

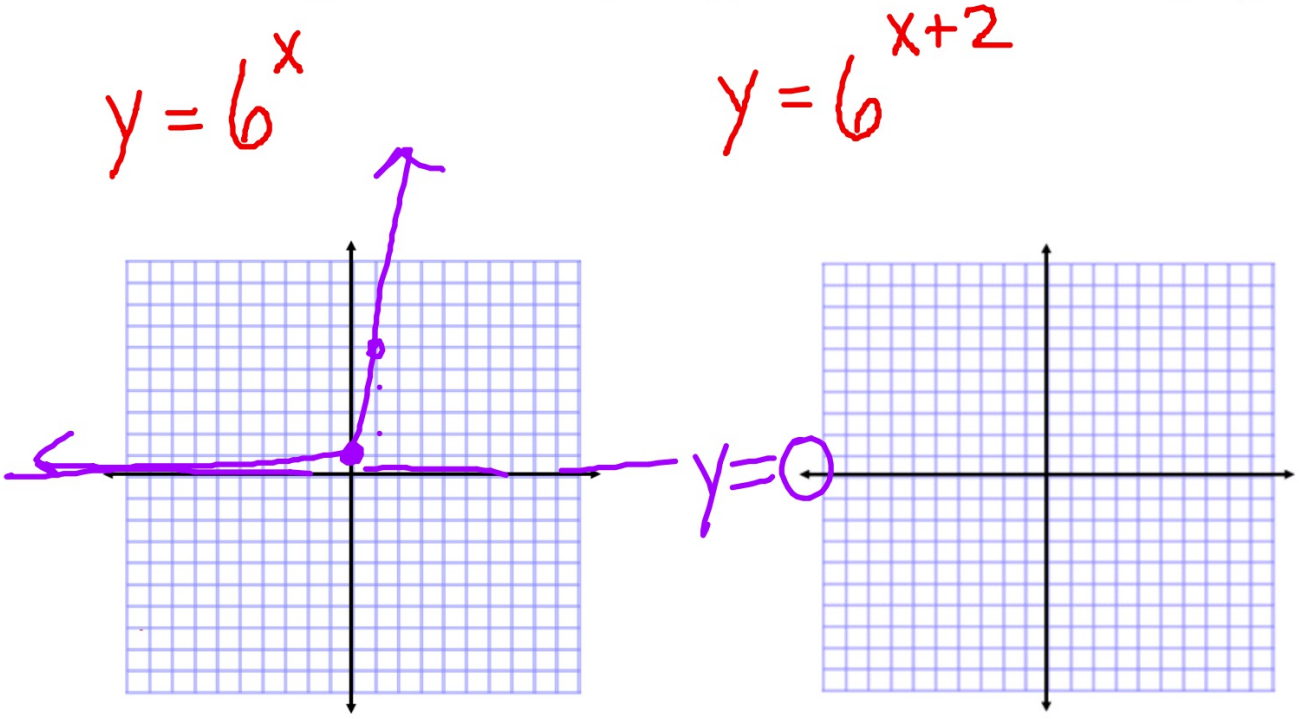
btw- a fractional base corresponds to a negative exponent



d: $\mathbb{R}$

r: $(0, \infty)$

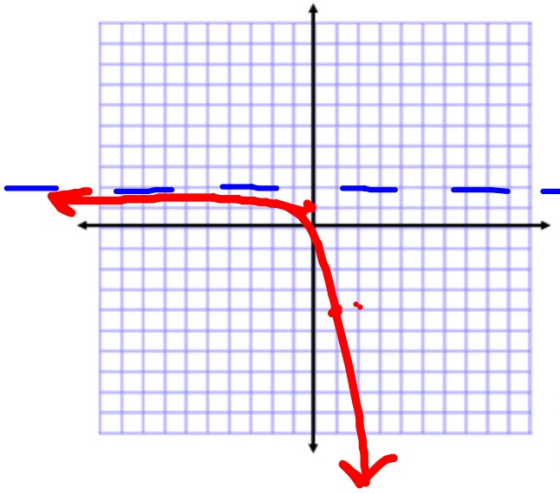
Sketch...listing the domain, range and horizontal asymptote



d: all real numbers
r: (0,infinity)
horizontal asymptote at y = 0

Sketch- include the y-intercept, one other point and the HA.

$y = -6^x + 2$



✓flipped

✓moved up 2

y-int @ (0,1)

$y = 2$ ← HA

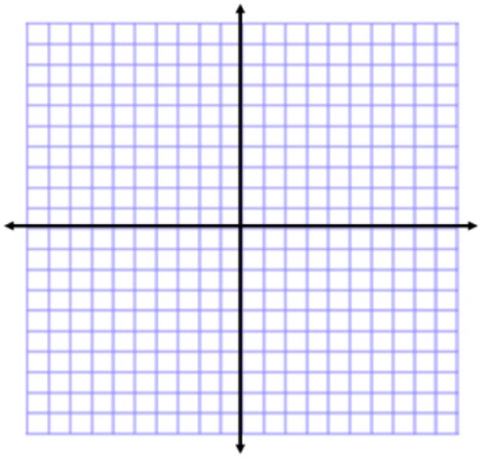
Let $x = 0$

d: $(-\infty, \infty)$

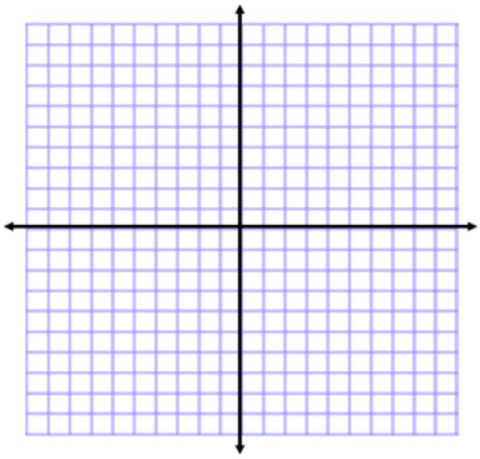
r: $(-\infty, 2)$

domain? range? HA? y-intercept?

$y = 6^{-x} - 3$



$y = -6^{-x}$



Sec 4.1, page 451
1,3,7,
11,13 (detailed sketch),
19-24
25-33 (odds, rough sketch)

1. 10.556
3. 11.665
7. 9.974

11. should be rising, left to right and contain the points (-1, 1/4), (0,1) and (1,4)

13. should be rising, left to right and containt the points (-1, 2/3), (0,1), (1,3/2)

19. $H(x) = -3^{-x}$

20. $g(x) = 3^{x-1}$

21. $F(x) = -3^{x}$

22. $f(x) = 3^{x}$

23. $h(x) = 3^{x} - 1$

24. $G(x) = 3^{-x}$

25. rising, shifted left 1
contains (-1,1), (0,2)
asymptote at y = 0
domain- all reals
range (0,∞)

27. rising, shifted down 1
contains (0,0), (1,1)
asymptote at y = -1
domain- all reals
range (-1,∞)

*using table function on graphing calculator
*can see graphs in my teacher's edition text

29. rising, shifted left 1, down 1
contains (-1,0), (0,1)
asymptote at y = -1
domain- all reals
range- (-1,∞)

31. falling, flipped over the x-axis
contains (0,-1) and (1,-2)
asymptote at y = 0
domain- all reals
range (-∞, 0)

33. rising, steeper
contains (-1,1) and (0,2)
asymptote at y = 0
domain- all reals
range- (0,∞)